

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions:

1. (Currently Amended) An apparatus comprising:
 - a voltage regulator having an output path to supply a voltage to power an electrical component, a power consumption rate of the electrical component to fluctuate during operation;
 - a ~~first sense point~~ board-sense circuit to sense a first feedback signal at a first sense location on the output path, said board-sense circuit comprising a transient filter to capture steady-state feedback; and
 - a ~~second sense point~~ load-sense circuit to sense a second feedback signal at a second sense location on the output path, said load-sense circuit comprising a steady state filter to capture transient feedback, said first and second steady-state feedback and said transient feedback signals to at least partially represent fluctuations in the power consumption rate, and said voltage regulator to adjust the voltage based at least in part on a combination of the ~~first and second feedback signals~~ steady-state feedback and the transient feedback.
2. (Previously Presented) The apparatus of claim 1 further comprising:
 - a motherboard to which the voltage regulator is coupled; and
 - a socket to couple the electrical component to the motherboard.
3. (Previously Presented) The apparatus of claim 2 further comprising:
 - the electrical component;
 - wherein the first sense location is on the mother board; and
 - wherein the second sense location is on the electrical component.
4. (Previously Presented) The apparatus of claim 1 wherein the electrical component comprises a processor die.

5. (Cancelled)

6. (Cancelled)

7. (Currently Amended) The apparatus of ~~claim 5 of claim 1~~ wherein the ~~load-sense circuit steady state filter~~ comprises:

a passive filter to ~~capture signal transients in the second feedback signal~~.

8. (Currently Amended) The apparatus of ~~claim 5 of claim 1~~ wherein the ~~load-sense circuit steady state filter~~ comprises:

a capacitive element; and

a resistive element in parallel with the capacitive element.

9. (Currently Amended I) The apparatus of ~~claim 5 of claim 1~~ wherein the ~~load-sense circuit steady state filter~~ comprises:

an active filter to ~~amplify signal transients~~ the transient feedback in the second feedback signal.

10. (Currently Amended) The apparatus of ~~claim 5 of claim 1~~ wherein the ~~load-sense circuit steady state filter~~ comprises:

an amplifier; and

a passive filter.

11. (Original) The apparatus of claim 10 wherein:

the second sense location comprises a differential pair; and

the amplifier comprises:

a first resistive element coupled between a first line of the differential pair and a first node;

a second resistive element coupled between a ground node and the first node;

a third resistive element coupled between a second line of the differential pair and a second node;

a differential amplifier having a first input coupled to the first node, a second input coupled to the second node, and an output coupled to a third node; and

a fourth resistive element coupled between the second node and the third node, said third node coupled to the passive filter.

12. (Previously Presented) The apparatus of claim 1 wherein:

the second sense location comprises a differential pair; and

the second sense location comprises differential sense points across the electrical component.

13. (Previously Presented) The apparatus of claim 12 wherein the second sense location comprises:

a first sense pin for a source voltage at the electrical component; and

a second sense pin for a source ground at the electrical component.

14. (Previously Presented) The apparatus of claim 1 wherein the second sense location comprises a sense pin on the electrical component.

15. (Previously Presented) An apparatus comprising:

a first input circuit to provide a steady-state feedback from a first sense location in an output path, said first sense location being on a motherboard;

a second input circuit to provide a transient response feedback from a second sense location in the output path, said second sense location being on an electrical component that is electrically coupled to the motherboard; and

a voltage regulator to regulate a voltage on the output path to power the electrical component based at least in part on a combination of the steady-state feedback and the transient response feedback, said steady-state feedback and

said transient response feedback to at least partially represent fluctuations in a power consumption rate of the electrical component during operation.

16. (Original) The apparatus of claim 15 wherein the second input circuit comprises a passive, high-pass filter.

17. (Original) The apparatus of claim 15 wherein the second input circuit comprises a capacitor in parallel with a resistor.

18. (Original) The apparatus of claim 15 wherein the second input circuit comprises an active, high-pass filter.

19. (Previously Presented) The apparatus of claim 15 wherein the second sense location comprises a differential pair of sense points on the electrical component, and wherein the second input circuit comprises:

a differential amplifier having two inputs to couple with the differential pair of sense points.

20. (Original) The apparatus of claim 19 wherein the second input circuit further comprises:

a first input resistor to couple in series with a first one of the differential pair of sense points and a first input of the two inputs of the differential amplifier;

a second input resistor to couple in series with a second one of the differential pair of sense points and a second input of the two inputs of the differential amplifier;

a ground resistor to couple a ground to the first input of the differential amplifier; and

a feedback resistor to couple an output of the differential amplifier to the second input of the differential amplifier.

21. (Original) The apparatus of claim 20 wherein the second input circuit further comprises:

a passive, high-frequency filter coupled to the output of the differential amplifier.

22. (Original) The apparatus of claim 20 wherein the second input circuit further comprises:

a capacitor and a resistor coupled in parallel, said capacitor and said resistor coupled in series to the output of the differential amplifier.

23. (Original) The apparatus of claim 15 wherein the voltage regulator comprises:

an error amplifier;
a pulse-width modulator; and
a buck regulator.

24. (Currently Amended) A method comprises:

sensing a first feedback signal at a first sense location on an output path;
filtering transient components from the first feedback signal to capture steady-state feedback;

sensing a second feedback signal at a second sense location on the output path;
filtering a steady-state component from the second feedback signal to capture transient feedback; and

regulating a voltage to power an electrical component on the output path based at least in part on a combination of ~~the first feedback signal and the second feedback signal~~ steady-state feedback and the transient feedback, said ~~first and second feedback signals~~ steady-state feedback and said transient feedback to at least partially represent fluctuations in a power consumption rate of the electrical component during operation.

25. (Previously Presented) The method of claim 24 wherein the first sense location is on a motherboard and the second sense location is on the electrical component, said electrical component being coupled to the motherboard by a socket.

26. (Cancelled)

27. (Currently Amended) The method of claim 24 wherein ~~sensing the second feedback signal~~ filtering the transient components comprises:
passively filtering the second feedback signal to capture ~~signal transients~~ the transient feedback.

28. (Currently Amended) The method of claim 24 wherein ~~sensing the second feedback signal~~ filtering the transient components comprises:
actively filtering the second feedback signal to amplify ~~signal transients~~ the transient feedback.

29. (Previously Presented) A system comprising:
a motherboard;
a processor coupled to the motherboard; and
a voltage regulation circuit to provide a voltage signal to power the processor, said voltage regulation circuit comprising
a first input circuit to provide a steady-state feedback from a first sense location in a voltage path for the voltage signal, said first sense location being on the motherboard;
a second input circuit to provide a transient response feedback from a second sense location in the voltage path, said second sense location being on the processor; and

a voltage regulator to regulate the voltage signal based at least in part on a combination of the steady-state feedback and the transient response feedback, said steady-state feedback and said transient response feedback to at least partially represent fluctuations in a power consumption rate of the processor during operation.

30. (Original) The system of claim 29 wherein the second input circuit comprises a passive, high-pass filter.

31. (Original) The system of claim 29 wherein the second input circuit comprises a capacitor in parallel with a resistor.

32. (Original) The system of claim 29 wherein the second input circuit comprises an active, high-pass filter.

33. (Previously Presented) The system of claim 29 wherein the second sense location comprises a differential pair of sense points on the processor, and wherein the second input circuit comprises:

a differential amplifier having two inputs to couple with the differential pair of sense points.